Reportable Disease Rules 101

ON 4/11/2006 CHANGES to the Rules and Regulations Governing Idaho Reportable Diseases (Rules), adopted during the 2006 legislative session, went into effect.

The changes pertinent to health-care providers include the following:

1 Norovirus infection is now reportable. Reports must be made within one working day after diagnosis.

2 Reporting time frames have been altered for several pathogens:
- Tularemia: reportable immediately day or night (previously reportable within 24 hours), and
- Shigellosis: reportable within 1 working day (previously reportable within 3 working days).

3 Management of ill food employees (including work restrictions and testing requirements to remove work restrictions) has been clarified.

The current reportable disease list may be downloaded from http://epi.idaho.gov/.

The complete rules may be found at http://adm.idaho.gov/adminrules/rules/idapa16/16index.htm.

The Value of Reporting

1 Do I need to report?
- It's the law. Reportable disease rules may be enforced according Idaho Code and other applicable statues and rules. Penalties could be civil or criminal in nature. Penalties are referenced in 16.02.10.995 http://adm.idaho.gov/adminrules/rules/idapa16/16index.htm.

2 Is it OK for me to report?
- The privacy rule, HIPAA, strikes a balance between protecting patient information and allowing traditional public health activities to continue. According to HIPAA, patient information may be collected by a public health authority that is authorized by law to collect or receive such information for disease surveillance, prevention, investigation, and intervention purposes. You can learn more about HIPAA by accessing the following web sites: http://www.hipaa.org/ or http://www.cdc.gov/nip/policies/hipaa/hipaa_factsheet.htm.
- All public health activities in Idaho are carried out to protect confidentiality.

3 What's the point of timely reporting?
Reporting, according to the rule, allows public health staff to investigate disease reports and engage in intervention and prevention activities quickly to reduce the spread of disease in the community. Examples of such activities are:
- Health education or counseling to the patient and patient contacts
- Restriction or exclusion of infectious persons from work, school, or daycare
- Referral of patient contacts for diagnosis, treatment, or other preventive service
- Inspection or notification of daycare or workplace
- Recommendations for environmental testing or decontamination
- Prevention messages for the public

Physician reporting in addition to laboratory reporting is essential and may provide advance warning prior to receipt of a laboratory report. In addition, laboratory testing is not indicated or required for confirmation of all reportable diseases.

4 What happens to the data?
- Local public health districts and the Office of Epidemiology and Food Protection (OEFP) track disease counts locally and statewide to evaluate trends in disease incidence.
- OEFP transmits deidentified data to CDC on Idaho reportable diseases that are nationally notifiable.
- Tracking of disease trends and sharing data with public health and healthcare partners contributes to strategic planning for local and state public health programs.

If diseases are not reported, public health cannot respond to protect the health of the community. Questions or concerns regarding disease reporting? Contact your local public health district or OEFP.

ROUTINE PHYSICIAN 24-Hour Disease Reporting Line... 1.800.632.5927
EMERGENCY PHYSICIAN 24-Hour Reporting Line.......... 1.800.632.8000

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IDAHO DISEASE Bulletin
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Division of Health
P.O. Box 83720
Boise, ID 83720-0036

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Boise, ID

Volume 13 Number 3 • June 2006

IDAHO DISEASE Bulletin

IDAHO DEPARTMENT OF HEALTH & WELFARE

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more inside

Multistate Outbreak of Mumps

Between 2001 and 2003, fewer than 300 cases of mumps were reported annually nationwide. A multi-state outbreak of mumps infections has been under investigation in 11 states since December, 2005[1]. Between January 1 and May 2, 2006 a total of 2,597 cases of mumps (49% classified as confirmed) have been reported in Colorado, Illinois, Iowa, Kansas, Minnesota, Mississippi, Missouri, Nebraska, Pennsylvania, South Dakota, and Wisconsin (Figure 1). Although the original source of the current US outbreak is unknown, it may have started on an Iowa college campus. The outbreak is considered ongoing; however, it seems to have peaked the first week of April, 2006 in Iowa, the state with the highest number of cases (approximately 1,487 probable and confirmed cases). In outbreak states the frequency of mumps was highest in those 18–24 years of age, possibly reflecting the college student population initially affected, but cases have been seen in all age groups. Data has been collected from 1,192 cases from Iowa. Of those affected, 6% were unvaccinated, 12% had received one dose of MMR, and 51% had received two doses of MMR, while 31% had an unknown vaccination status. Contributing factors considered include vaccine efficacy below 100%, waning immunity in the affected population, transmission facilitated through crowded living conditions on college campuses, vaccination less effective at reducing asymptomatic or atypical infections, and delayed recognition and diagnosis of the rare condition by health-care providers.

Twelve samples from six affected states all yielded the genotype G mumps strain, the same genotype circulating in the United Kingdom (UK), where an outbreak involving > 70,000 cases has been ongoing from 2004 to 2006. Most UK cases have occurred among unvaccinated young adults. The G genotype is not an unusual or rare genotype and, like the rest of known genotypes of mumps, it has been circulating globally for decades or longer.

Idaho has had seven sporadic cases of mumps reported between 2001 and 2005 (range: 0–3 cases per year). Several suspect cases have been under investigation in Idaho since January of 2006. At this time, three cases have been confirmed, one in a two-year old child, one in a 13-year old child and one in a 49-year old woman. None of the reported cases to date appear epidemiologically linked with the outbreak in the Midwest.

Public Health Challenges Revealed

A number of public health challenges have arisen from the current outbreak, including:

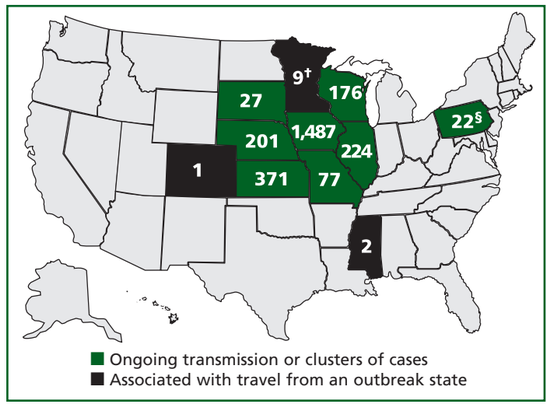
1 Clinical recognition of the disease;
2 Interpreting serology in previously vaccinated individuals;
3 Vaccine recommendations; and
4 Prevention.

Clinical Recognition

Unilateral or bilateral self-limiting swelling of the parotid or other salivary glands lasting 2 or more days, without other apparent cause, is considered the clinical definition of mumps but these symptoms may be absent in more than 30% of cases. Some mumps infections are associated with nonspecific or primarily respiratory symptoms with or without glandular swelling, and approximately 20% of infected persons are asymptomatic. Confirmed infections have laboratory evi-

Multistate Outbreak of Mumps continued–

Figure 1. **Number* of reported mumps cases linked to multistate outbreak, by state – United States, January 1-May 2, 2006.**



* N = 2,597
† Three cases related to the outbreak
§ Twelve cases related to the outbreak

dence to support the clinical diagnosis or are epidemiologically linked to another case of mumps. Other conditions can cause parotid swelling, including cytomegalovirus, parainfluenza virus types 1 and 3, and influenza A virus. Thus, the absence of parotid swelling does not rule out mumps in an exposed person with nonspecific respiratory symptoms, and the presence of parotid gland swelling is not diagnostic of mumps.

Laboratory Findings

Available tests through the Idaho Bureau of Laboratories include virus culture from buccal swabs (urine culture has low yield and will no longer be offered) and serology. PCR antigen detection tests are under development at CDC and are being field-tested in Iowa during the outbreak; however, PCR is not available at this time for routine diagnostic work.

The presence of IgM antibodies, which occur early in infection, peaking within 1 week, and/or a 4-fold rise in IgG antibodies is considered diagnostic in an unvaccinated individual. With previous vaccination, serum IgM may be negative in 50–60% of acute serum samples, and IgG levels might already be elevated at the onset of symptoms and consequently may not demonstrate a rise in paired sera, making serologic interpretation more difficult.

Vaccine Recommendations and Prevention

The measles-mumps-rubella (MMR) vaccine is apparently effective against the circulating strain currently blamed for the outbreak. According to CDC, outbreaks can occur in highly immunized populations. Two doses of MMR vaccine provide protection for mumps in approximately 90% of recipients while a single dose protects approximately 80% of recipients. CDC and OEFP recommends that unvaccinated or inadequately vaccinated individuals speak to their healthcare providers about vaccination.

On May 17, 2006, the Advisory Committee on Immunization Practices (ACIP) convened a special session to discuss updating the 1998 recommendations for the control and elimination of mumps, in light of this recent outbreak. On June 1, an MMWR[2] was released describing the updated recommendations that emerged from this meeting. Key changes from the 1998 ACIP recommendations (see box[2]) are described for school aged and college students, healthcare workers, international travelers and others in routine and outbreak settings.

Mumps virus has been isolated from saliva from between two and seven days prior to onset of symptoms until nine days after onset of symptoms. Anyone with mumps should not go back to childcare, school, or work for 9 days after symptoms begin. Non-immune healthcare workers exposed to mumps virus are restricted from patient care for 26 days after exposure, due to the long incubation period of mumps. This lengthy restriction is costly and disruptive for healthcare facilities, thus ensuring mumps immunity in healthcare workers is vital. CDC has recently updated specific prevention guidelines for healthcare workers, including immune status assessment and exclusion criteria. These guidelines may be found at http://www.cdc.gov/nip/diseases/mumps/control-hcw.htm.

Key changes to 1998 ACIP recommendations on mumps – May 17, 2006

Acceptable Presumptive Evidence of Immunity

- Documentation of adequate vaccination is now 2 doses of a live mumps virus vaccine instead of 1 dose for
  - School-aged children (i.e., grades K-12)
  - Adults at high risk (i.e., persons who work in health-care facilities, international travelers, and students at post-high school educational institutions).

Routine Vaccination for Health-Care Workers

- Persons born during or after 1957 without other evidence of immunity: 2 doses of a live mumps virus vaccine.
- Persons born before 1957 without other evidence of immunity: consider recommending 1 dose of a live mumps virus vaccine.

For Outbreak Settings

- Children aged 1-4 years and adults at low risk: if affected by the outbreak, consider a second dose* of live mumps virus vaccine.
- Health-care workers born before 1957 without other evidence of immunity: strongly consider recommending 2 doses of live mumps virus vaccine.

* Minimum interval between doses = 28 days.

[1] CDC. Update: multistate outbreak of mumps - United States, January 1-May 2, 2006. MMWR 2006;55:1-5.

[2] CDC. Notice to Reader: Updated Recommendations of the Advisory Committee on Immunization Practices (ACIP) for the Control and Elimination of Mumps. MMWR 2006;55 (Early Release);1-2

Additional information: CDC Mumps home page: http://www.cdc.gov/nip/diseases/mumps

Idaho Study Suggests Non-O157:H7 *E. coli* Infections are More Common Than Expected

SHIGA-TOXIN PRODUCING *E. COLI* (STEC) are known to cause diarrheal illness and are thought to be associated with hemorrhagic colitis and hemolytic uremic syndrome (HUS). *E. coli* O157:H7 is considered the most common serotype associated with STEC outbreaks in the U.S; however, there are approximately 50 other non-O157 STEC serotypes accounting for 36–57% of shiga-toxin producing strains, which could also cause significant illness and outbreaks. An association has been described between the development of HUS and prior antibiotic therapy for the treatment of STEC-associated disease[1]. Because of a lack of routine screening for the non-O157 STECs in Idaho and nationwide, the burden of illness attributable to these non-O157 STEC pathogens is unclear.

Under-detection of STEC could arise through two common practices: using blood in diarrhea as a testing determinant and sole reliance on Sorbitol-MacConkey agar (SMAC) plates by clinical laboratories to detect STEC[2]. One CDC study reported that only 27% of STEC-positive specimens were positive for blood, and serotypes other than O157:H7 (non-O157 STEC) cannot be easily distinguished using only SMAC plates as a screening tool.

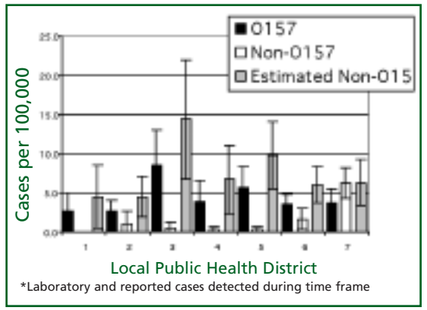
The Idaho Bureau of Laboratories (IBL) was interested in determining if a significant number of STEC infections were undetected, and thus unreported in Idaho, by the current testing paradigm used by most health care workers and clinical laboratories. Beginning in 2002, IBL began offering free STEC testing for all clinical laboratories in Idaho on stools from which no other enteric pathogens were recovered, bloody or not. Fourteen participating hospitals throughout the state were asked to collect a culturette from diarrheal samples at the time of culture set-up. If the routine stool culture was negative in their hands, the swab was forwarded to IBL for further analysis. In addition, the Eastern Idaho Regional Medical Center (EIRMC) clinical laboratory in health district 7, which already routinely screens stool samples for STEC with a culture-independent toxin-screening method, also worked with IBL for further characterization of toxin-positive samples. Between 2002 and 2004, IBL analyzed EIRMC samples and those from the additional 14 those stool samples from submitting hospital laboratories to determine if a significant number of STEC infections were being overlooked.

IBL inoculated the submitted stool samples from the 14 clinical labs from all participating laboratories into GN or MacConkey broth overnight and screened broths for the presence of Shiga-toxin (stx) by an enzyme immunoassay (stx-EIA)[3] Shiga-toxin positive broths (including those submitted from EIRMC) were characterized further biochemically, serotyped, and evaluated by multiplex PCR for toxin genetic sequences. Samples from which an isolate was not recovered in the initial broth phase were characterized by STEC multiplex PCR alone. The findings suggested that STEC infections were clearly being missed by the routine methods of testing. Between 2002 and 2004, 2813 stool samples were submitted to IBL from the 14 clinical laboratories and 2904 samples were evaluated by EIRMC approximately 6000 stool samples from across the state were evaluated for evidence of Shiga-toxin (either by IBL or submitting hospital laboratory) and characterized further, when possible, by IBL as described above. IBL found that 88 stool samples tested positive for STEC by stx-EIA between all submitting participating agencies. Isolates were recovered from 56 of 88 enrichment broths and included the following serotypes: (22) O157:H7, (11) O26:H11, (7) O111:NM, (5) O145:NM, (4) O'undetermined:NM, (1) O'undetermined:H34. (1) O121:H19, (1) O121:NM, (1) O103:H2, (1) O103:H25, (1) O146:H21, and (1) O165:NM.

Routine toxin screening by EIRMC carried out in the Idaho Falls (District 7) region detected a significant increase in numbers of non-O157 STEC cases, when compared to other local public health districts where hospital laboratories did not routinely use toxin-screening methods. In fact, 2% of EIRMC stool samples examined in the District 7 region tested positive for STEC and 53% of those were found to be non-O157 serotypes. In addition, non-O157 STEC were also found through enhanced screening efforts in the other 14 submitting hospital laboratories. These data estimate a low but significant presence of STEC in diarrheal stool samples from which other enteric pathogens were not recovered and which would have been missed by traditional testing approaches.

Figure 2 represents mean rates of O157:H7 and non-O157 STEC infections in Idaho between 2002 and 2004, based on routine disease reports sent to the health districts and those found independently through this study. In addition, the graph depicts an estimate of the STEC infections which may have been procedurally missed by current testing methods.

Figure 2: **E. coli O157, non-O157 STEC* and Estimated Mean Rates of Procedurally Missed STEC-Associated GI illness by Idaho Health District – 2002-2004**



*Laboratory and reported cases detected during time frame

These data suggest that a low but significant number of non-O157 STEC infections may be detected in diarrheal stool samples from which other enteric pathogens were not recovered and which would have been missed by traditional testing approaches. This study suggests the value of routine screening for Shiga-toxin producing bacteria in all diarrhea samples. The Office of Epidemiology and Food Protection and IBL encourage Shiga-toxin testing of stools from all persons with diarrhea or HUS already being examined for other enteric pathogens, where other pathogens have been rules out.

For further information on managing infectious diarrhea, the "Practice Guidelines for the Management of Infectious Diarrhea" by Guerrant, et al. is available from the Infectious Diseases Society of America (CID 2001:21 (1 Feb), pp 331-351) or through their web site http://www.journals.uchicago.edu/CID/.

This article was contributed by Vivian Lockary, Walt DeLong, and Richard Hudson from the Idaho Bureau of Laboratories.

[1] Wong CS, Jelacic S, Habeeb RL, Watkins SL, Tarr PI. The risk of the hemolytic-uremic syndrome after antibiotic treatment of *Escherichia coli* O157:H7 infections. N Engl J Med 2000;342(26):1930-6.

[2] E. coli O157:H7: Procedure for Isolation and Identification from Stool Specimens Foodborne and Diarrheal Diseases Branch, Centers for Disease Control and Prevention Publication: 08/01/1994 http://wonder.cdc.gov/wonder/prevguid/p0000445/p0000445.asp

[3] Premier™ EHEC test, Meridian Bioscience, Inc., Cincinnati, OH